

Management of access

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Abstract

The management of access is critical in minimising the spread of *Phytophthora*. Recreational activities on CALM-managed lands present much greater risks than those posed by commercial operations which are licence or permit based. This is because the latter are more strictly supervised, and non-compliance with licence conditions can have implications for ongoing activities. In our management of access we attempt to balance the competing demands for requirements of access versus the need to protect areas from introduction of *Phytophthora*. With our present state of knowledge it is necessary to control access very strictly on some high value areas. This means total exclusion or permit based entry to *some* areas. It appears that in general the issue of management control of *Phytophthora* is still viewed by the public and local government as a State government problem which is mostly too hard for others to address. Main Roads (Western Australia) have procedures which review the cost/benefits of incorporating management in their programmes and make decisions on implementation based on risk and final cost. Main Roads will also assist Shires in developing dieback management techniques in road construction and maintenance. The management of access in relation to *Phytophthora* requires significant resources in planning such as the cost of management procedures and costs incurred by industry to meet standards imposed.

Management options that can be implemented to minimise introduction or spread of the fungus on 2WD and 4WD gravel roads are:

- improvement in the surface formation and drainage,
- demarcate existing disease areas associated with roads,
- manage maintenance according to hygiene standards,
- use seasonal or permanent closure as a means of protecting areas, and
- establish clean down stations at entrances to national parks and other areas of high conservation value.

For foot access on managed paths:

- limit activities with the potential to spread the fungus into dieback-free areas,
- use techniques such as surface hardening or boardwalks to reduce spread of infected soil,
- careful selection of alignment,
- implement seasonal closure,
- close permanently if high values are at risk,
- use strategically-located boot cleaning stations, and
- provide information.

Introduction

Other papers in this issue have provided a wide ranging overview of plant diseases in WA and the extent to which they are influencing our environment. The management of plant disease affecting native vegetation in WA has focused primarily on *Phytophthora* and in particular *P. cinnamomi*. This focus is due to the widespread distribution and the high level of impact the fungus is having on native vegetation throughout the South West. This paper is confined to the management of access in relation to plant disease, caused by *Phytophthora* spp.

Access is recognised as being one of, if not the, crucial factor in the artificial spread of the fungus in the south-west

of Western Australia and it continues to be a critical and often contentious issue when considering the management objectives for land set aside for conservation. The issue is contentious because the management of access is really about the management of people and trying to accommodate their needs/wants against land management objectives for an area. The definition of access according to the Oxford Dictionary is: "approach; (to) right or means of approaching or reaching". To many (West) Australians, access particularly on Crown lands has been considered an inalienable right. Where access didn't exist it was created. The age of the 4WD vehicle has provided equivalent motorised opportunity to match that previously enjoyed by horsemen. In many respects we are talking about a cultural ethos with which many landowners, local authorities and management agencies have had to come to terms in the last 20 years or so.

Management of access can be looked at in terms of

1. lands managed by CALM (including State forest), and
2. lands other than those set aside strictly for the purpose of

conservation, *i.e.* the management of roadsides as well as other reserves and vacant Crown land set aside for a different purpose and managed by authorities/bodies other than CALM.

Conservation lands

Phytophthora/dieback is currently considered to represent the greatest single threat to the conservation values in the south west of the State in the short term. In the longer term, other factors such as the influence of climatic change may be important (but difficult) to manage! As a result of this, CALM and non-government conservation groups are concerned that management should be directed toward preventing the introduction of the fungus into areas not currently infested, or minimising its spread where it is already present or carrying out some control measures to protect species or communities from the fungus.

This sentiment is strongly presented in the CALM Policy (Conservation and Land Management 1991a) which states as its objectives:

- to minimise the introduction, spread or intensification of the plant diseases caused by *Phytophthora* species throughout the State, with particular emphasis on the south-west,
- to monitor for *Phytophthora* activity in the remainder of the State, including tropical areas,
- to undertake and support research into the disease and its control, and
- to encourage the West Australian community to share our concern over the problem, and its management.

These key objectives, however, must also recognise that one of CALM's three primary programmes is recreation (Conservation and Land Management 1993a). Provision of access is obviously a significant component of this programme which can often be in conflict with other objectives. In addition to this there are also requirements to accommodate access for a range of government approved activities, such as

- timber production in State forests,
- mining exploration and mining,
- commercial operations *e.g.* apiarists, wildflower picking,
- research activities,
- fire protection needs, *i.e.* firebreaks, *etc.*, and
- construction and maintenance of roads and powerlines.

The development of access carries with it other implications for the management of disease. These include the source of road making materials, the dieback status of these materials, and drainage control.

To deal objectively with the issues that arise in making decisions about differing needs for access, there is a requirement for effective and practical guidelines. These are generally provided by the Department of Conservation and Land Management's dieback policy, Regional Management Plans, Area Management Plans and Dieback Protection Plans, and are dealt with more specifically by separate procedures for mining and commercial activities such as timber production, bee keeping, wildflower picking and research activities. To be able to make decisions about access there is a need to have good information about where the disease is, the risk of introducing the fungus during an operation; chances of it surviving if it is brought in; the impact it may have. Some of

these questions resolve themselves into the concept of 'hazard' which is defined as the final impact of *Phytophthora* on a site if introduced. Obviously in areas where the hazard and the risk of introduction are low the options to manage are somewhat broader compared to where the hazard is, say high to very high.

For the following discussion we propose to direct our comments to the area within the defined *Phytophthora* zone in the south-west, where we are dealing with a high to very high hazard.

Recreation access

The most complex and trying aspect of access management is that related to recreation pressures. This is because management strategies need the co-operation of a large number of mostly unsupervised visitors to be effective.

Recreational access can generally be considered in terms of 2WD access, 4WD access, foot access, and other access, *i.e.* horses, cycling.

2WD roads

Sealed roads, once in place, do not present a high (but there is some) risk to vehicle traffic spreading the fungus. If the area which is traversed by the road is dieback-free then management of roadside operations should be conducted with careful attention to maintenance practices. If the alignment was infected prior to sealing then, intensification is likely due to roadside runoff and drainage.

Unsealed roads can present a considerable concern for management since roads external to a reserve may be managed entirely differently to roads within a reserve. Therefore, with no guarantee of hygiene on roads outside of a conservation reserve, there is a considerable risk that the fungus will be either introduced or spread by vehicles moving into the reserve.

In parks, Gazetted roads not under the control of CALM present similar concerns. In the case where a gravel spur road leaves a sealed road, the options presented also apply. If the alignment is not infected initially then risk of infection would be low, particularly if construction was undertaken under strictly controlled conditions.

The management options on existing roads are:

1. have 2WD roads in good condition and well drained,
2. identify disease areas and manage the road to limit the risk of picking up infected soil, *i.e.* with use of culverts; raising of road, crowning of road,
3. conduct maintenance operations in dry soil with attention to demarcating disease areas within catchment boundaries according to hygiene standards. (Conservation and Land Management 1986),
4. impose seasonal access restrictions (such management options can be difficult to implement because of inconsistency in weather conditions from year to year.),
5. impose closures based on conditions which present a high risk. This can be difficult to implement in remote locations because of distance and unpredictable response of people who have travelled a considerable distance to get there, such closures must also consider people who

may already be at a site served by a road that is proposed to be closed, and

6. establish clean down stations at boundaries where roads are subject to different management regimes. Such options have been considered at places like the Fitzgerald River National Park, however the costs and practicalities of such facilities have discounted their use to date.

In situations where:

- there is no complementary management on existing roads that are serving a reserve, and
- where dieback hazard is high to very high, and
- dieback is in the general area,

then there is a high degree of inevitability that the fungus will be transported into an area. This is because management capability in keeping *Phytophthora* out of an area depends on the success of all phases of operations over a long time including the impact of changing personnel on continuity of work standards. This is therefore a system in which the risk of a breakdown of procedures is high.

4WD access

If the fungus is known from nearby and conditions are suitable, then 4WD access is a particular concern because the nature of these roads usually means that drainage is a problem and therefore the risk of moving infected soil can be high at particular times throughout the year.

The options for management are:

1. permanent closure and rehabilitation - if this is the best way of meeting management objectives, *i.e.* values are very high.
2. continue use - if the alignment is already exhibiting the impact of the disease it may be possible to continue use if this does not place substantially more vegetation at risk. Additionally, if there is concern/risk in taking infected soil away from the road then control over the timing of access may be appropriate.
3. seasonal closure is an alternative which can deal with the situation where access conditions and risk change dramatically with change of season.
4. "opportunistic" closure which is event linked. This option is good only if the area can be easily serviced by management, *i.e.* accessible immediately after the event which is likely to cause concern for access, and therefore enforceable.
5. Upgrading of 4WD standard roads often leads to 2WD standard.

Foot access

Unmanaged foot access can lead quite rapidly to erosion on slopes greater than 3%, (Lands, Park and Management 1987). In addition management of foot access can be an important issue where introduction or spread of *Phytophthora* is a concern. There is a considerable amount of circumstantial and substantiated (from sampling) evidence to demonstrate the spread of *Phytophthora* by foot traffic, particularly along the south coast. Once introduced to areas high in the profile, the potential for extensive damage is quite significant, as is ably demonstrated by the situation in the Stirling Range National Park.

Management of foot access has been based on:

1. mapping of disease occurrence,
2. identification of areas apparently not affected,
3. limiting current activities which have the potential to spread the fungus into areas identified as apparently dieback free,
4. using simple techniques to reduce the risk of taking infected soil upslope (or further along a path) *i.e.*
 - improve the path surface, *e.g.* use of stone to harden surface; boardwalks to avoid high risk areas
 - use clean down stations,
5. identifying the best location for the alignment, *i.e.* one side of a ridge,
6. monitoring dieback status,
7. implementing seasonal closure if the risk warrants it, and
8. permanent closure of paths if high values are at risk.

The key to reducing the risk in high hazard environments where it is necessary (or preferable) to provide a path is to

- provide a good alignment,
- provide a good walking surface,
- ensure adequate drainage, and
- engineer to minimise boggy/wet patches.

Information and public feedback

Management action must be supported by information to the users of lands to gain their support, understanding and co-operation in relation to managing access. Signs alone don't do the job and there aren't enough people on the ground to educate and enforce different measures.

Actions undertaken to control access in conservation lands for the management of *Phytophthora* are not always popular when first introduced. This is because they inevitably conflict with existing/traditional activities. Despite the volume of written material published and that presented through the television and radio media, the depth of understanding of the public concerning the issue is very shallow. This is quite understandable when considering the difficulty in coming to grips with an invisible fungus that in most cases can only be recognised from where it's been (*i.e.* dead plants), the fact that impacts can vary from dramatic in the short term to incremental over a long time (and most don't see them anyway), and that for most people the issue doesn't directly affect them to any great degree. It really falls into the category of an "SEP" (Someone Else's Problem). This difficulty in coming to terms with what the presence of the disease may mean to plant communities and environment as a whole in even the short to medium term (*i.e.* 1-5 years) is clearly evident in reviewing the public response to draft management plans for conservation areas.

Generally, public perception and response with regard to *Phytophthora*, its impacts and the measures taken to control its spread in areas managed for conservation seems to be:

- the issue exists (some disagree) and
- sure, we should do something about it, and
- management actions are basically OK as long as they don't affect what I want to do!

Access is always a contentious issue in the planning process, especially where a history of existing use is in evidence. An extreme view on the South Coast is that CALM

invented dieback so it could interfere with people's enjoyment of National Parks. There is also a view expressed by a minority that key conservation areas should be closed to any access.

We do not have the answer to the question of "how do we overcome this?" At the moment, the depth of understanding and concern that individuals have over this issue is closely related to the extent that they are involved in it. If people don't want to know, or aren't interested, then it is unlikely any approach other than enforcement will be effective. Education of the younger generation in schools is possibly the best option, but by the time they are old enough to influence the situation the issue is probably going to be all over.

It really is a matter of the extent we want to protect and more importantly retain, the diversity and values of our native vegetation.

Other activities in conservation lands

As stated, the Dieback Policy really sets out how we should go about managing access. In addition, there are specific guidelines for other more commercially oriented activities.

— Timber Production. The set of prescriptions in "Timber Harvesting in WA" (Conservation and Land Management 1993a) very clearly sets out the standards for roading and conditions under which access is provided in State Forests.

— Parts of State Forest are still included in Disease Risk Areas where access controls are prescribed. These areas were originally gazetted for a period of three years to allow for mapping of dieback disease, during which time access controls were stringently enforced. This system is now being reviewed.

— Apiary activities are addressed by a CALM policy statement (Conservation and Land Management 1992). This includes guidelines on how vehicle access is to be managed and who bears responsibility for costs incurred to ensure ongoing access availability.

— Wildflower picking is conducted under a Commercial Purposes licence under the Wildlife Conservation Act which includes specific instructions on access, in particular on land tenures such as State forest. Wildflower picking is not allowed in Nature Reserves and National Parks. Management of illegal picking has been a major problem in the past and still continues to be an issue of concern.

There are considerable risks associated with managing a wildflower industry based primarily on Crown lands despite a licensing condition specifying the use of existing tracks only. The indiscriminate creation of new tracks and access has led to the recent removal of *B. baxterii* and *B. coccinea* from the picking list, because of the threat that *Phytophthora* now presents to these species in all Crown lands.

Research

Access for research purposes must also conform to the standards that are applied to other land users. This can mean that research proposals have to be amended. These aspects are dealt with in assessing research proposals both for inter-

nal and external research programmes. In the past there is no doubt that intensive research programmes have contributed to disease spread. No group of users is immune from having the capability of being a vector of the fungus.

Management activities

Management operations and personnel similarly have the potential to spread the fungus and therefore regular training and adherence to procedures is essential. The Hygiene Evaluation Test is a critical tool to ensure the right questions are asked about any proposed operation (Conservation and Land Management 1993b).

Mining

The State government's mining policy sets out the procedures under which all proposals are assessed. These procedures include referrals to CALM and the Minister for the Environment to consider whether standard conditions are adequate to address environmental concerns. Access (timing, method, degree of disturbance) is a critical issue in the assessment of proposals. New access (grid lines, etc) created by legal operations can provide opportunities for unauthorised access by people who are unaware of the strict conditions under which such access was developed and utilised. The conditions which are applied to mining and petroleum operations, particularly exploration activities are quite strict and with respect to dieback controls, are from my experience usually well managed.

Summary

In respect to Conservation land then, there is a significant difference in the management of access for recreation as opposed to the more commercially-based operations. This is because the commercial operations usually involve small number of people who have been longer in the job, are better trained, are involved with localised areas, and are either licence or permit based which carries implications for non-compliance with conditions. They are usually supervised to some extent by CALM staff.

The key point about management of access is that all the various options

- cost money to carry out according to the standards set,
- need compliance to work,
- need management presence/supervision, and
- need to be regularly monitored.

Much of the access network in conservation lands is managed in the absence of these points. We are not able to provide the money required or the supervision needed to ensure compliance.

Management of access on other lands

No other agencies currently manage lands with the objective of controlling or minimising the introduction or spread of *Phytophthora* through control of access. Those who do carry out some management include some of the mineral sands mining operations over their lease areas.

To date, few local authorities have been able to develop policies and address dieback issues in their planning of proposed road works despite the fact that a format for such a document has been prepared by CALM and provided to local authorities on request. Despite being approached through the country Shire Councils Association to develop an approach to dieback, it would appear that the issue for local government authorities is just,

- too hard, and/or
- too expensive, and/or
- is perceived to be unnecessary by some.

There are a number of difficulties confronting local authorities in dealing with this issue. They are:

- recognition of the disease,
- survey and sampling costs,
- skills,
- operational costs,
- administrative hassles.

The most active and structured program is that being developed by Main Roads WA (Napier 1992). With over 3000 km of roads within the dieback susceptible areas of the State, Main Roads has a large task with specific problems facing them in the management of roadside areas. However the department has the will and technical expertise to work towards dealing with the issue. Five categories which influence the management of roadsides have been identified by MRWA:

1. uncontrolled access,
2. road drainage,
3. on going maintenance,
4. gravel supplies, and
5. dieback mapping.

These various factors must be taken into consideration when assessing and planning an operation to see if the balance of "benefits" from undertaking controls of Dieback are worth the costs and effort.

Decision-making flow-charts have been developed to assist in the assessment of proposed works and the selection of relevant Dieback controls. Knowing the extent of the disease over the road network is a primary requirement for their program to proceed and contributes to the management of *Phytophthora* on more than just a local level. However, application of dieback management to all possible activities which may spread the fungus is proving extremely difficult, e.g. hygiene procedures for maintenance grading over long sections of road shoulder. This is proving expensive and often impractical and it is difficult to identify any positive value from the work because of the unknown dieback status and history of most of the roadsides. As with all groups concerned with doing something to ameliorate the threat of *Phytophthora*, there is always a concern that unless more stakeholders are involved and show a similar readiness to make real efforts then the efforts of an individual group will be greatly jeopardised or worse, be a waste of effort.

Case studies

Stirling Range National Park

A considerable proportion of the Stirling Range National Park has been affected by *Phytophthora cinnamomi*. It is apparent that the combination of soils, rainfall and a diverse

susceptible flora has provided a situation very conducive to the survival and activity of the fungus. Most vegetation types are severely affected. The wandoo woodlands, however do not exhibit symptoms of the disease due to the lack of susceptible species.

Over the last eighteen months considerable effort has been directed at identifying those areas apparently dieback free, particularly in the higher peaks. Current information suggests that few areas of protectable dieback free vegetation exist on the higher peaks. There do however appear to be considerable areas, including some of the lower peaks that are apparently die-back free. It seems likely that those areas have remained free of *Phytophthora* because they have offered less of an attraction for bush walkers and other activities that have been conducted in the park.

Various options have been considered to protect vulnerable areas from introduction of the fungus. The use of boardwalks and clean down stations such as at Mondurup Peak are one means of trying to minimise the risk of introduction of the fungus. The situation as presented for Stirling Range National Park is now being considered during the Management Planning process. The question of how to deal with access throughout the park is, as usual, complicated by the competing demands of park users.

Fitzgerald River National Park

The distribution of *Phytophthora* spp in the Fitzgerald River National Park was presented in the Fitzgerald River National Park Management Plan (Conservation and Land Management 1991b). This map was based on up to date information at the time and showed the distribution of both *P. cinnamomi* and *P. megasperma*. The difficulty of recovering *P. megasperma* from apparent disease sites and the impact of the 1989/90 fires which affected many previously suspect sites resulted in many areas being identified as "suspect" in the plan, relying on future monitoring to clarify the situation. Very wet years in 1992 and 1993 initiated widespread symptoms of *Phytophthora* activity in both eastern and western ends of the park and this has been subsequently confirmed by sampling recoveries of *P. megasperma*. It is now apparent that *P. megasperma* is present extensively along some road sections in the Fitzgerald River National Park and that these infections are probably quite old.

Management operations in the park, particularly since 1986, have been conducted under strict hygiene based on the premise that most areas were dieback free. The recent revelations have highlighted the difficulty of managing road systems that were in place prior to vesting. In this situation we have identified spread of *Phytophthora* from infections on old alignments that have been closed to traffic for over a decade. The implications for management is that any work on these road sections which may result in conditions suitable for the fungus (such as drains/culverts) will probably result in 'new' areas of disease expression. The intermittent behaviour of the fungus also makes monitoring of operations much more complicated.

The picture in the Fitzgerald River National Park is far from clear and highlights the need for better understanding of *P. megasperma* in this environment and its potential long term impacts.

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